

# Javelin: Man-portable Close Combat Missile System

STEVEN WHITMORE

Initially designed as an anti-armor missile, the Javelin has proved to be extremely effective for today's unconventional warfare and is actively defeating not only armored threats but also other vehicles, fortifications, and urban targets in theater. Employed at the Infantry company level in U.S. Army brigade combat teams, Javelin is playing a prominent role in both Operations Iraqi Freedom (OIF) and Enduring Freedom (OEF).

"Javelin is ideal for the Infantry Soldier," according to LTC Erik Simonson, Deputy Product Director for Javelin Weapon Systems, Close Combat Weapon Systems (CCWS), Program Executive Office Missiles and Space (PEO MS). "They can reach out and touch the enemy faster and farther than the enemy can touch them without the need to wait for close air support."

The warfighters agree. "The Javelin missile was an invaluable weapon in defeating enemy armored forces and reinforced positions to include bunkers, building, and revetments. There is no other weapon that can support dismounted infantry in fighting against these types of engagements," states the after action report of the U.S. Army's 3rd Infantry Division (Mechanized) following the 2003 invasion of Iraq.

Javelin is the first "fire-and-forget" shoulder-launched, anti-tank missile fielded to the U.S. Army and U.S. Marine Corps. Replacing the wire-guided Dragon missile system, Javelin consists of a missile in a disposable launch tube and a reusable Command Launch Unit (CLU), which houses the daysight, night vision sight (NVS) and controls. The CLU allows for battlefield surveillance, target acquisition, missile

launch, and battle damage assessment. Training is supported by three components that are fielded with the system: the Missile Simulation Round, Field Tactical Trainer, and Basic Skills Trainer.

The Javelin Basic Skills Trainer provides training in field surveillance, target locating and acquisition, and fire mission control in the classroom, garrison, or aboard ship. It features preprogrammed training scenarios that are available through a color LCD display embedded in the simulated CLU.

*A Marine with Task Force 2nd Battalion, 7th Marine Regiment fires a Javelin missile at enemy targets during an assault on a Taliban-held compound in Afghanistan in August 2008.*

LCpl Gene Allen Ainsworth III, USMC



Operational switches and controls perform exactly like the actual equipment.

Javelin offers a top-attack flight mode to defeat armored vehicles, as well as a direct-attack mode for use in urban terrain against buildings or fortifications. The Javelin's fire-and-forget guidance enables the gunner to fire and then immediately take cover, greatly increasing survivability. Additionally, Javelin's soft launch reduces the visual and acoustic signature of the missile, making it difficult for the enemy to identify and locate the gunner. The limited back blast also enables gunners to safely fire from enclosures and covered fighting positions.

A man-portable system, Javelin is the only close combat missile system that can be operated primarily in a dismounted role. At less than 50 pounds, Javelin is designed to take the fight to the enemy and give dismounted Soldiers the ability to deal with a host of unexpected threats. Its imposing lethality, high reliability, and small logistics tail make Javelin ideally suited to rapid deployment.

### Modern History

In 1989, the U.S. Army Aviation and Missile Command awarded a contract to the Javelin Joint Venture (JJV) for the development of Javelin as a replacement for the M47 Dragon anti-tank missile. The JJV was formed by Texas Instruments (now Raytheon Missile Systems) of Dallas, Texas, and Lockheed Martin Electronics and Missiles (now Lockheed Martin Missiles and Fire Control) of Orlando, Fla. The CCWS Project Office, part of PEO MS at Redstone Arsenal, is responsible for the Javelin Missile System and its lifecycle management. In 1994, Low Rate Initial Production (LRIP) of Javelin was authorized, and in 1996 the first Javelins were deployed with U.S. Army units. Full-rate production began in May 1997.

More than 25,000 missiles and 6,600 CLUs have been sold to the U.S. Army, U.S. Marine Corps, and international customers. Javelin has been selected by the armed forces of 11 allied nations: the United Kingdom, Australia, New Zealand, Ireland, Norway, Lithuania, the Czech Republic, Taiwan, Jordan, United Arab Emirates, and the Sultan of Oman. Another six nations are currently considering the Javelin system.

Production of the Block I missile upgrade began in 2006, with successful qualification firings taking place in January 2007. The Block I missile upgrade features an improved rocket motor that reduces the missile's time of flight, improved probability of hit/kill at 2,500 meters, and an enhanced performance warhead that increases Javelin's lethality. Full materiel release for the Block I missile was received in 2008 and the first production lots are now in the U.S. Army stockpile.

The Block I CLU upgrade received full materiel release in 2007 and fielding to units began that same year. A significant performance improvement in the Block I CLU is an increase in target identification range through use of a larger afocal lens (12X vs 9X) plus the addition of electronic zoom capability. Surveillance operating time was increased through a combination of longer lasting batteries



CPL John Rafoss

*A British Royal Marine carries a Javelin missile launcher while on patrol as part of Operation Soud Chara in the Helmand Province of Afghanistan in late December 2008.*

and CLU power management. Additional improvements include improved software processing, a digital display with menu-driven access to features, the ability for the gunner to select between a "black hot" or "white hot" display, and an RS-170 standard video output to allow remote viewing of the gunner display. Units deploying to theater have priority for being fielded CLUs with Block I upgrades.

These improvements are geared at maintaining Javelin's lethality against the latest armor, while developing greater effectiveness against irregular threats. Future modifications include a multipurpose warhead featuring shaped charges for armored vehicles and fragmentation for anti-personnel effects. Army laboratories have contributed a significant investment to ready the multipurpose warhead (MPWH) for productionization. The cut-in of the MPWH into the Javelin production line, when funded, will represent a significant increase in capability against the type of irregular targets that our warfighters are currently pitted against and will continue to face in future fights. The MPWH will not only be very effective against bunkers, snipers, insurgents placing IEDs, and other soft targets, but it will also maintain its lethality against the world's best armored vehicles and tanks.

CCWS is also looking to develop precision terminal guidance (PTG), which would allow the gunner to redirect the missile mid-flight, and advanced networking capability to provide and transmit real-time tactical data for operations or surveillance.

### In Theater

A Javelin-equipped commander not only controls the tempo of the battlefield but also influences its shaping.

"A few well-placed shots with the Javelin will bring an enemy's approach to a halt," said MAJ Bill Venable, assistant TRADOC Capability Manager, Infantry Brigade Combat Team (TCM-IBCT). "The enemy commander is forced to reconsider his approach and

the array of forces he is presenting to the U.S. force.”

Since its fielding, Javelin has changed the way enemy armored forces plan assaults on suspected U.S. Infantry areas of operation.

“A single Javelin team of two Soldiers can hide in a concealed location more than a mile and a half away from an approaching tank formation and kill the best tanks in the world with proven effectiveness,” said MAJ Venable. Battlefield comments from Iraqi soldiers who were in tank formations that were engaged by U.S. Soldiers corroborated that the Iraqis were not able to detect the launch or approach of the missiles. Tanks in the formation started exploding around them before they knew anything was happening. Javelin was also critical in the taking of Baghdad Airport and in the Battle of Debecka Pass, where 30 U.S. Special Forces who were pinned down by an advancing Iraqi armored column used the Javelin to stop the enemy in its tracks and sustained no casualties.

Following the neutralization of the armored tank threat in the early days of OIF, Javelin continues to see extensive use in the unconventional battlefields of Iraq and Afghanistan. The U.S. Army, U.S. Marine Corps, and British allies are effectively employing Javelin against a wide range of secondary targets including light-skinned vehicles, bunkers, buildings, and other fortifications as well as personnel.

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“The Javelin gunner becomes the most powerful weapon in the entire battalion,” according to a certified Javelin gunner who witnessed firsthand the power of the missile during the Second Battle of Fallujah, site of some of the heaviest urban combat in OIF. Soldiers who used Javelin or saw the weapon in action attest to its effectiveness as an urban assault weapon. The Javelin can be carried up to the top of a building or fired from inside a small room

using its soft-launch feature. With its pinpoint targeting, a Javelin gunner can send the missile directly through a door or window.

British troops, in particular, are having great success using Javelin to defeat irregular targets at extended ranges. Of the more than 1,200 Javelins fired by British troops, none has been used against armored targets.

The CLU, used in the stand-alone mode for battlefield reconnaissance and target detection, has also proven effective in both Afghanistan and Iraq. The most powerful man-portable sensor on the battlefield below battalion level, it provides dominant surveillance capability to the dismounted Soldier. The CLU is employed at the front lines of combat formations and is likely one of the very first sensors to detect an enemy target. Its long-wave infrared sensors can see through today’s complex battlefields, characterized by sandstorms, smoke, dust, explosions, fog, and obstructions; and enables night surveillance from more than two miles away. The CLU’s stand-alone surveillance capability makes the Javelin ideally suited for peacekeeping and stability operations as well.

Proven in combat, Javelin boasts an operational readiness rate of greater than 98 percent.

“Our Soldiers report complete confidence in the performance of the system. Its reliability, both from a maintenance and lethality perspective, contributes to that sense of confidence,” said MAJ Venable. “It works when you need it, it hits what you’re aiming at, and it kills anything it hits.”

As Javelin continues to receive positive reviews from the front lines of ongoing operations, the lessons learned in theater are actively shaping the program. Javelin offers a strong growth potential due to the system’s modular construction, CLU software enhancements, and adaptability to a wide range of platforms. Its combat-proven effectiveness as a precision man-portable system ensures that the Javelin will be a key weapon system for many years to come. Our warfighters will continue to take the weapon forward into the fight wherever it is needed — whether it is the crowded, urban neighborhoods of OIF or the remote, austere terrains of OEF.

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CPL Nathan D. Hurd

*A Marine with the 3rd Battalion, 1st Marine Regiment uses a CLU to provide overwatch for Soldiers operating in Fallujah in November 2004.*